

REMARKS

Favorable reconsideration is respectfully requested.

The claims are 1-5.

The above amendment is responsive to points set forth in the Official Action.

Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Kimbara et al. (U.S. 6,362,436).

Further, claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Kimbara et al. (U.S. 6,479,760).

These rejections are respectfully traversed.

The effective date of the above references is February 4, 2000. However, these references are antedated by Applicants' Japanese priority application which supports the present claims in all essential respects.

A copy of Applicant's Japanese priority application is already of record and an English translation is submitted herewith, thereby establishing a July 29, 1999 effective date for the present application.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishii et al. (U.S. 5,368,921) in view of Touzaki (JP 11-77892, with an English translation provided).

This rejection is respectfully traversed.

Ishii et al. (U.S. 5,368,921) discloses a metal-foil-clad laminate obtained by lamination molding a resin-impregnated substrate containing 5 to 30% by weight of an inorganic filler having a specific average particle diameter and a metal foil.

Ishii et al. discloses that a woven glass fabric having a thickness of preferably from 0.05 to 0.2 mm (from 50 μ m to 200 μ m) can be used.

However, Ishii et al. do not at all disclose or suggest the glass woven fabric used in the present invention, having a specific gas permeability. The present invention uses a glass woven fabric having a specific thickness, a specific weight and a specific gas permeability, and thus, the present invention shows excellent surface roughness, modulus of rigidity and hole processability, as described in the Experimental Report submitted with the response dated March 12, 2003.

Touzaki (JP11-77892) discloses a process for the production of a copper-clad laminate, comprising heating and fluidizing a resin composition which contains an epoxy resin, a phenol novolak resin and an epoxy resin curing agent and is in a solid or half-solid state at ordinary temperature, applying the fluidized resin composition to a copper foil, loading a fiber base material on the copper foil, further laminating another copper foil thereon and then integrating and curing the resultant set by heating (Claim 1).

Touzaki discloses the following:

A conventional process in which a thermosetting resin composition is diluted with a solvent and the thermosetting resin composition is impregnated into a fiber base material to produce prepreg, has problems in that the productivity is poor and that low-pollution cannot be achieved. Therefore, it is desired to make the resin composition solvent-less. Although a drying process can be skipped when a solvent-less liquified thermosetting resin composition is used, it is difficult to impregnate a fiber base material with a resin, which causes the problem of many air bubbles being present in the base material. [0002]

Touzaki proposes the production method disclosed in claim 1 as a means to solve the above problems

Touzaki discloses a glass fiber woven fabric as a fiber base material and discloses that the gas permeability thereof is preferably 1-15 cc/cm²/sec, undesirably, there is a possibility that air bubbles remain in the base material.

Touzaki Examples 1 and 2 and Comparative Examples 1 and 3 disclose that glass fabrics were used in Example 1 and Comparative Example 1. However, Touzaki does not describe the gas permeability of the above glass fabrics. Touzaki discloses that a glass fabric having a gas permeability of 10 cc/cm²/sec and a glass fabric having a gas permeability of 20 cc/cm²/sec were used in Example 3 and Comparative Example 2 respectively.

The present invention, on the other hand, relates to a copper-clad laminate of a glass fabric/thermosetting resin base material, which is used to form a small-diameter hole with a carbon dioxide gas laser and is formed of prepreg obtained by impregnating a glass woven fabric

having a specific gas permeability, etc., with a thermosetting resin composition being dissolved in a solvent.

The copper-clad laminate of the present invention is suited for the formation of a hole with a carbon dioxide gas laser. As is found in Table 1 of the present specification and the Experimental Report attached to the response dated March 12, 2003, the copper-clad laminate of the present invention has a characteristic feature in that holes with a hole wall having no roughness are made with a carbon dioxide gas laser.

In contrast, the invention of Touzaki relates to the production method of a copper-clad laminate in which a solvent-less thermosetting resin composition is heated and melted, the melted resin composition is applied to a copper foil, a fiber base material is loaded on the copper foil, another copper foil is further laminated thereon, and the resultant set is integrated and cured by heating. When the solvent-less thermosetting resin composition is used to produce a prepreg, resin impregnation into fiber base material is difficult, so that many air bubbles occur. Touzaki describes that it is preferred to use a glass fiber woven fabric having a gas permeability of 1-15 cc/cm²/sec for preventing the above occurrence of air bubbles.

That is, the invention of Touzaki uses the solvent-less thermosetting resin composition. In contrast, the present invention uses the thermosetting resin composition being dissolved in a solvent. Therefore, the structural requirements of Touzaki and the present invention are completely different.

Further, the present invention uses the glass woven fabric having a specific gas permeability, etc., and thus succeeds in providing a copper-clad laminate which is suited for the formation of holes with a carbon dioxide gas laser. In contrast, in addition to the difference concerning the resin composition, Touzaki does not at all teach what functions and effects will be exhibited when holes are made with a carbon dioxide gas laser.

The object of Ishii et al. is to provide a copper-clad laminate which has excellent surface smoothness and drilling processability and can be used in forming finer patterned printed circuits (col. 2, lines 5 to 12).

In sum, the present invention is not taught even by the combination of Ishii et al. and Touzaki.

For the foregoing reasons, it is apparent that the rejections on prior art are untenable and should be withdrawn.


With regard to the rejection of claims 1-5 on the ground of obviousness/double-patenting over claims 1-7 of commonly assigned U.S. 6,479,760, there is submitted herewith a Terminal Disclaimer which disclaims a terminal portion of any patent maturing from the present application which extends beyond the expiration date of the commonly assigned patent.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

Respectfully submitted,

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